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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/954,753	09/18/2001	David B. Marshall	7784-000314	8505

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EXAMINER

EDMONDSON, LYNNE RENEE

ART UNIT

PAPER NUMBER

1725

DATE MAILED: 04/04/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/954,753

Applicant(s)

MARSHALL ET AL.

Examiner

Lynne Edmondson

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-- Th MAILING DATE of this communication appears on th cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 17 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-8 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Campbell et al. (USPN 5125179).

Campbell teaches a joint assembly which can be used in any type of structure for any purpose comprising a ceramic matrix composite conduit (sleeve 12,13), a metal conduit (sheaths 18,19) and an insert (liner 11) disposed inside the ceramic conduit (figures 2 and 4 and col 3 lines 17-50 and col 4 lines 24-52). As the parts are tubes they are presumed to have circular cross sections (figure 2). The parts may be joined in any manner including but not limited to brazing, welding and soldering to form an identical assembly. The ceramic matrix comprises graphite fibers (col 5 lines 52-56) in a matrix of silicon carbide (col 1 lines 42-44 and col 4 lines 53-62). The insert comprises silicon carbide or silicon nitride (col 3 lines 30-50). The conduits are joined by securing the insert (11) inside the conduit (12) which comprises a fiber preform and co processing (col 5 lines 39-69) after which a metal conduit (18,19) is secured to the insert (col 4 lines 23-37). See also Campbell claims 1, 2 and 7-12.

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2. Claims 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Davis et al. (USPN 5208071).

Davis teaches a process of securing a ceramic insert inside of a ceramic preform a joint assembly which can be used in any type of structure for any purpose comprising a ceramic matrix composite conduit (28, 30), a metal conduit (pipes) and an insert (26) disposed inside the ceramic conduit (figure 6 and col 5 lines 30-46). The insert is co-processed with a fiber preform wherein a ceramic slurry is infiltrated into the preform (col 4 lines 36-67 and col 5 lines 1-17). A metal conduit (pipe) is placed over the ceramic material and secured (col 6 lines 39-67). The assembly comprises a ceramic matrix composite conduit (28), an inner ceramic insert (26) and metal pipes.

3. Claims 1-3, 5, 8-12, 14-17, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Barringer et al. (USPN 5230306).

Barringer teaches a joint assembly which can be used in any type of structure for any purpose, particularly forming nozzles and bonding them to metal manifolds (col 1 lines 16-39) comprising a plurality of ceramic matrix composite conduits (sleeves 38, col 3 lines 50-56), a metal conduit (36) and plural inserts (pins 78) disposed inside the ceramic conduit (figures 3-5 and col 5 lines 19-46). As the parts are tubes they are presumed to have circular cross sections (figure 2). The parts may be joined in any manner including but not limited to brazing, welding, cementing and soldering to form an identical assembly. The insert comprises silicon nitride (col 1 lines 58-60). The conduits are joined by securing the insert inside the conduit which comprises a fiber

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preform and co-processing by slurry infiltration (col 5 lines 42-60) after which a metal conduit (36) is secured to the insert by cementing and welding (col 5 line 61 – col 6 line 10 and col 6 lines 42-68). See also Barringer claims 1-7, 11-16 and 28-31.

4. Claims 1-3 and 5-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Okuda et al. (USPN 5639322).

Okuda teaches a joint assembly which can be used in any type of structure for any purpose, comprising a plurality of ceramic matrix composite conduits joined to metal conduits (col 6 lines 33-35 and col 36 lines 29-49) through a silicon nitride insert or intermediate (col 9 line 10, col 31 lines 20-39 and col 32 line 61 – col 33 line 5). The ceramic may be silicon carbide or silicon nitride (col 9 lines 5-13 and col 28 lines 31-53). Parts are joined by brazing or soldering (col 24 lines 34-43 and col 38 lines 30-63). A plurality of parts may be joined by the same method (col 29 lines 53-67). It is noted that the parts may be joined in any manner including but not limited to brazing, welding, cementing and soldering to form an identical assembly.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al. (USPN 5125179).

Campbell teaches a joint assembly which can be used in any type of structure for any purpose comprising a ceramic matrix composite conduit (sleeve 12,13), a metal conduit (sheaths 18,19) and an insert (liner 11) disposed inside the ceramic conduit (figures 2 and 4 and col 3 lines 17-50 and col 4 lines 24-52). As the parts are tubes they are presumed to have circular cross sections (figure 2). The parts may be joined in any manner including but not limited to brazing, welding and soldering to form an identical assembly. The ceramic matrix comprises graphite fibers (col 5 lines 52-56) in a matrix of silicon carbide (col 1 lines 42-44 and col 4 lines 53-62). The insert comprises silicon carbide or silicon nitride (col 3 lines 30-50). However, there is no disclosure of multiple joints or indication that the joint is used for a rocket nozzle.

It would have been obvious to one of ordinary skill in the art at the time of the invention to that although the terms nozzle and manifold are not used, the joint structure is the same (Campbell, figure 2) and as the joint must be able to withstand high temperatures and internal pressures it is capable of being used in a rocket nozzle (Campbell, col 1 lines 10-15 and col 3 lines 10-17). Multiple joints formed in the same manner as individual joints would be an obvious variation of a single joint.

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barringer et al. (USPN 5230306).

Barringer teaches a joint assembly which can be used in any type of structure for any purpose, particularly forming nozzles and bonding them to metal manifolds (col 1 lines 16-39) comprising a plurality of ceramic matrix composite conduits (sleeves 38, col 3 lines 50-56), a metal conduit (36) and plural inserts (pins 78) disposed inside the ceramic conduit (figures 3-5 and col 5 lines 19-46). As the parts are tubes they are presumed to have circular cross sections (figure 2). The parts may be joined in any manner including but not limited to brazing, welding, cementing and soldering to form an identical assembly. The insert comprises silicon nitride (col 1 lines 58-60). The conduits are joined by securing the insert inside the conduit which comprises a fiber preform and co-processing by slurry infiltration (col 5 lines 42-60) after which a metal conduit (36) is secured to the insert by cementing and welding (col 5 line 61 – col 6 line 10 and col 6 lines 42-68). However, there is no disclosure of a brazing step.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the conventional securing method of brazing as an obvious alternative to welding and cementing (Barringer, col 5 lines 61-68) and thereby form a secure seal (Barringer, col 6 lines 5-18) or high strength bond (Barringer, col 2 lines 24-31) to form nozzles with high strength, thermal stability and corrosion resistance in a simple and effective manner (Barringer, col 2 lines 7-23).

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. MacLean et al. (USPN 5231833), Nied et al. (USPN 5290333), Atmur et al. (USPN 5947094), Cox et al. (USPN 6418973, nozzle, manifold, SiC, Si<sub>3</sub>N<sub>4</sub>), Alvin et al. (USPN 6290743 B1, ceramic and metal conduits joined through inserts), Newkirk et al. (USPN 5420085, Kang et al. (USPN 5108025, ceramic and metal conduits joined through inserts, brazed), Bothwell (USPN 4376374, slurry, SiC) and Tuffias et al. (USPN 5855828, nozzle, fibers, SiC, Si<sub>3</sub>N<sub>4</sub>, precursor slurry).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699. The examiner can normally be reached on M-F from 7-4 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-7115 for After Final communications.



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

Lynne Edmondson

Examiner

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A handwritten signature in cursive script, appearing to read "Lynne Edmondson".

3/31/03

LRE

March 31, 2003